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ABSTRACT

The report presents results of the development and field testing procedures of a computer based language library retrieval system as part of the Assessment of Language Training for Preschool Handicapped Children Project. The report focuses on the data processing system, the user's manual or thesaurus, the dissemination strategy, a cost analysis, ways to maintain the system, and a proposed maintenance budget. It is pointed out that a computer based language library storage and retrieval system could be designed to effectively provide users with general or specific segments of available language literature. Alternatives considered for maintaining and updating the system range from complete federal support to none. The option most strongly supported involves a maintenance plan where an organization such as the Kansas Neurological Institute would contract with the Bureau of Education for the Handicapped (BEH) to update and maintain the system. It is explained that through this plan, users could be required to pay for some portions of the service while BEH subsidized others. Among enclosures are a sample user's packet. (Author/SBH)

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- ED177773

The Development and Maintenance of a Computer Based Storage and Retrieval System for Language Literature[1]

FINAL REPORT - VOLUME IV

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Doug Guess, Wayne Sailor, and William J. Keogh

with

Clay Sutton
Computer Analyst

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[1]The preparation of this report was supported by a six months extension of RFP No. R0077FPA grant entitled Assessment of Language for Preschool Handicapped Children awarded by U.S.O.E., School Systems Branch.

EC 121124

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THE DEVELOPMENT AND MAINTENANCE OF A

COMPUTER BASED STORAGE AND RETRIEVAL SYSTEM FOR LANGUAGE LITERATURE

(FINAL REPORT)

Within the past decade, interest in language acquisition and intervention among normal and severely handicapped children has become one of the most thoroughly studied areas of the developmental process. Theorists representing divergent theoretical positions have begun to learn from each other; researchers have uncovered viable strategies for studying language as it emerges in normal children and designed potentially useful language intervention programs; and most importantly, practitioners and educators are beginning to incorporate language assessment and mediation as part of the severely handicapped child's overall educational curriculum. These developments can be compared to the often referred to "tip of the iceberg." Without question, the next decade should produce an even more productive period, contributing immensely to a greater understanding of the language learning processes.

It has become increasingly difficult, if not impossible, to keep abreast of all of the significant aspects of the language assessment, acquisition, and intervention literature. This observation was most vividly reinforced soon after the "Language Assessment" project began. Each of the three project sites quickly catalogued hundreds of important assessment strategies, research reports, and intervention programs. Clearly, the volumes of information that already exist, and the volumes that will surely become available as our understanding of speech and language improves, must be organized in such a way to reach broader audience. A system for sorting and storing divergent aspects of language related materials needs to be made available as a permanent resource.

The six months extension of the "Assessment of Language Training for Preschool

Handicapped Children" (Contract No. OEC-0-74-9184) project was requested to specifically explore the possibilities of developing an efficient method for disseminating speech and language information nationwide. We believe that a viable system has been developed.

This report will present the results of the development and field-testing procedures of a computer based language-library-retrieval system. The report will focus on: 1) the data processing system, 2) the user's manual, or thesaurus, 3) the dissemination strategy, 4) a cost analysis, 5) ways to maintain the system, and 6) a proposed maintenance budget.

THE DATA PROCESSING SYSTEM

The data processing system described in the extension request (January 20, 1976) was essentially the one that was used to develop the search and retrieve capabilities of the program. A FORTRAN IV program was designed by our computer analyst to store coded information concerning every article that was reviewed at the three project sites. An article, or a group of articles, could be retrieved by inputting specific keywords or descriptors via the computer program. An article, or a group of articles, would be retrieved that matched the keywords that had been programmed. The output was in the form of a computer print-out. A copy of the computer program is included in this report; it is stored on a standard, seven-track, 2400 foot tape and on a corresponding printed listing.

The user indicated the sort of retrieve that was of interest by coding a standard optical answer sheet (IBM 805 Form No. 1000 A4 45). A user's manual, or thesaurus, was prepared to provide instructions concerning the coding process. The manual will be described in more detail in a later section of this report. Once the coded information was received at the Kansas Neurological Institute, it was fed into an optical scanning (IBM 1230) machine which converted the information onto a computer card so that it could be interpreted by the FORTRAN IV program. After the search had been completed, the resultant print-out was mailed to the user.

Of course, the usual "programming-type" problems arose but these were solved through routine "debugging" procedures. In general, the data processing system proved to be as effective as we had hoped. It is recommended that this basic system be retained and expanded.

The User's Manual

A copy of the field-test version of the User's Request Manual is enclosed. From a user's point of view, the manual represents the most important dimension of the entire search and retrieval process. If too vague, it is likely that the user will be unable to retrieve the sort of information needed; if too detailed, it is possible that the user will become confused, make coding errors, or not use the system at all. The manual sought to minimize these potential hazards. Its design attempted to guide the user through the scoring process in a step-by-step fashion. Cues were also provided by color coding each major section. We believed that this version of the manual avoided confusion and enabled the user to obtain the kinds of information that were of interest. However, it can be improved along several dimensions. First, we do not believe that enough information was provided that described the and and the or features of the program. Identical keywords would produce different retrieves depending on whether the user wanted a search performed along the and feature over the or feature, and vice versa. A section needs to be provided to further explain this option. Second, the scoring places in the manual proper should be eliminated. In the first field-test version of the manual, the user was asked to code the keywords twice. All of the descriptors were to be coded directly in the manual proper; in addition, the IBM answer sheet was to be coded identically. This procedure was built into the manual to test whether processing and handling (by us and the user) would cause the optical scanning form to become soiled, torn, or rendered inoperable. If this proved to be the case, an additional "manpower" step would be required: That is, to transcribe the coded information appearing in the manual on to the optical

scanning form (answer sheet) by our staff. Virtually every optical scanning form has been returned in usable condition. Thus, the coding places shown in the manual can be eliminated. This would reduce the size and the general format of the manual considerably. Third, keywords that were omitted in the field-test version should be included. Certain keywords were left out of the first version of the manual even though the FORTRAN IV program is presently capable of searching and retrieving when they are used as input. They were omitted because we were trying to avoid making the manual too detailed and complicated. Only keywords that we deemed to be secondary descriptors were omitted (such as the descriptors BOOKS, UNPUBLISHED, RESEARCHER, and others).

The Dissemination Strategy

Several methods were considered to advertise the availability of the system. Each had some advantages and some disadvantages. One method considered was to extensively advertise the LLRS to the general public requesting that interested persons initiate the search and retrieve process by writing for the necessary materials. An advantage in this approach would be that a representative sample of the public's interest could be obtained. If properly "advertised," we could determine how heavily the LLRS would be used. The disadvantages, however, presented risks we were unwilling to take. Because we were operating within a relatively constrained time frame it was conceivable that not enough users would take the initiative to start the dissemination process in time for us to adequately field-test the system; it was equally possible that too many users would respond, preventing us from adequately financing and processing all of the requests. Thus, an alternative method was considered and eventually decided upon.

Throughout the two year period of the assessment grant project, most of the staff associated with the project "advertised" the LLRS at conferences, workshops, or through personal contacts. Also, inquiries concerning the availability of the

project's final report were received at KNI. Approximately 60 to 70 letters of interest were in our files. We decided to ask these individuals to serve as field testers. In addition, 30 individuals known to have an interest in language assessment and intervention, but who had not specifically written to us, were also asked to participate. Thus, the field test was based on a sample of 100 potential users. By using this approach we could be reasonably certain that we could process a manageable number of requests even in the unlikely event that all 100 persons responded to our invitation. In addition, since they were individuals who had already initiated an interest in our project, or who were known to be interested in language development processes, we believed that the response rate would be sufficiently high to allow for a representative test of the system. Each of the 100 "potential" users was sent a packet which contained a letter explaining the project, a manual, and an answer sheet. (A sample packet is enclosed.) At the time this report was being prepared, approximately 50% of the packets had been received. This number was sufficient to provide a reasonable test of the system and we are continuing to receive user's requests.

COMPUTER COSTS

This section deals primarily with computer (hardwear and softwear) costs. The one exception concerns the average cost for mailing the print-outs to users. While staff salaries, copying and reproduction, travel, etc. are integrally related to the total cost of the system, no attempt was made to average them into the computer expenses.

Essentially, there are five basic kinds of searches built into the system: (1) a comprehensive listing; (2) all intervention (training) materials; (3) all assessment materials; (4) all acquisition materials; and (5) all assessment and acquisition materials. Of course, (with the exception of No. 1) a portion of any of the categories could be searched and retrieved depending on the sort of descriptors used. A comprehensive listing includes the entire data base and this

search costs approximately between $60.00 and $70.00. During the field testing procedure, users were asked not to request a comprehensive listing. This was done for two reasons. First, such a retrieve is expensive; second (and most important), a comprehensive listing of the entire data base would not allow for a test of the search and retrieve function of the FORTRAN IV program. The computer costs required to search and retrieve the other categories are listed below:

a) All intervention (training) articles	$35.00
b) All assessment articles	40.00
c) All acquisition articles	40.00
d) All assessment and acquisition articles	60.00

Most users did not make a request that exhausted every article stored in one of the sections listed above. Thus, there was considerable variability in the size and the resultant search cost per print-out. Some print-outs were processed for less than $12.00. From our point of view the important figure is the average cost per print-out. This turned out to be approximately $25.00 per user. Processing time, memory, system printing, a tape drive, a storage device, and compiling were the component costs that made up the average cost.

All print-outs were mailed as "educational materials." The postal costs ranged from .35 to $2.16 and averaged $.76 per mailing. We believe that the averages for mailing and computer processing will remain relatively stable.

MAINTENANCE AND DEVELOPMENT OF LLRS

We did not extensively examine all of the alternatives for updating and maintaining the system. One alternative, of course, is for BEH to assume the system's maintenance and development. This alternative will not be discussed in detail since BEH staff is in a better position to make a judgment on this option than we are. A second option would be to transfer the system to a private organization, such as one of the major publishing firms. Most likely, this option would depend on the system's ability to be self-sustaining or profit making. Likewise, we do

not feel competent to discuss this alternative. Thus, the remainder of this section will be devoted to a detailed discussion of two other options. Both options would require the developers of the system (or a similar group) to update and operate it.

The Kansas Neurological Institute is not, and will likely never be, in a position to operate the LLRS as a self-sustaining entity. In order for an agency such as ours to serve as the primary operators, continued support from BEH would be necessary. We recommend that BEH enter into a contractual agreement with KNI, or a similar organization, to update and operate the LLRS for a specified period of time. One option, of course, is for BEH to make the service available to teachers, researchers, paraprofessionals, etc., at no charge to the user. This process would be essentially the same as existed during the six months field-test period. The period of agreement could be for one, two, or three years. Another option would be for BEH to subsidize most of the LLRS but require the user to "pay for" a portion of the service. For example, for the first year, a major effort could be devoted to a refinement process per se. During this period, the manual should be revised, new language assessment, acquisition, and intervention materials should be reviewed and stored in the system, and if needed, outdated articles should be deleted. This phase is identical to the one just described; however, during the second year, the financial burden could be gradually shifted from complete BEH support to partial, or none (depending upon how self-sustaining the LLRS becomes). It remains to be seen whether the public is willing to pay for the LLRS service. This can only be determined while support is "guaranteed" from BEH.

To assess the user's willingness to pay for the service, certain processing and search costs could be shifted from BEH to the user. At first (during the second year), the user would be required to pay for certain less expensive searches while the more comprehensive searches would continue to be provided free of charge. As the situation warrants, more and more search costs could be shifted to the user.

If, after the two year period, it is shown to be a service that can be made self-supporting (or almost self-supporting), then the participating agencies would be in a better position to determine the extent and nature of their participation on a long term basis. If it is shown that the system requires continued subsidation, then BEH would be in a better position to decide if the service warrants continued federal support.

The principle investigators at the KNI site and at the Kansas State University (and their respective staffs) enthusiastically endorse either of the options described above. If this is not possible, we strongly recommend that the system be maintained in some form. In our own view, and from the feedback we have received from others, the LLRS is on the threshold of filling a critical need. As the system becomes more publicized and well known throughout the country, we are convinced that it will be heavily used.

If BEH is willing to continue to support the LLRS for one or more years at this site, the work responsibilities that existed during the field-testing period would have to be slightly readjusted. Drs. Cairns and Butterfield (UKMC investigators) are not able to commit themselves indefinitely to the project. Thus the portion of the language assessment, acquisition, and intervention literature that they were responsible for would be shifted to the Kansas State and KNI sites. All infant acquisition and assessment materials would be reviewed by Dr. Longhurst and his staff; all infant intervention literature would be reviewed by Dr. Guess and his staff.

Proposed Maintenance Budget

The proposed maintenance budget listed below includes an estimate of yearly operating costs, less fringe benefits and overhead expenses. Although a rough

estimate, it represents a reasonably close approximation of actual operating costs:

Principle Investigator at KNI/KU Sites (Doug Guess)	10%	$ 2,500
Principle Investigator at Kansas State (Tom Longhurst)	10%	2,500
Project Director	100%	14,500
Computer Specialist	50%	7,100
Clerical/Research Assistant (KNI/KU)	100%	5,200
Clerical/Research Assistant (K-State)	100%	5,200
SALARIES		$37,000
Computer Costs		15,000
General Supplies		1,000
Postage and Handling		2,000
Copying and Reproduction		1,000
Travel		300
Books, Journals, etc.		600
Communications		200
MISCELLANEOUS		$ 20,100

TOTAL OPERATING COSTS (less fringe and overhead) $57,100

Summary

The six months extension period demonstrated that a computer-based, language library storage and retrieval system could be designed to effectively provide users with general, or specific, segments of available language literature. In our judgment, the LLRS represents the beginning of a vitally needed resource. The extent to which the service will be used by the public at large, however, needs to be more thoroughly documented. Several alternatives exist for maintaining and updating the system. They range from complete federal support to none. The option most strongly supported in this report involves a maintenance plan where an organization such as the Kansas Neurological Institute would contract with BEH to update and maintain the system. Through this plan, users could be required to pay for some portions of the service while BEH subsidized others. If this proves to be an option worthy of further consideration, the co-investigators of the original project would be willing to develop it in more detail.

Enclosures

a) FORTRAN IV program on magnetic tape.

b) FORTRAN IV program on a computer print-out.

c) Sample User's Packet.

d) Print-out of all articles contained in system.

Enclosures

STATE OF KANSAS
ROBERT F. BENNETT, Gov.

SOCIAL AND
REHABILITATION SERVICES
STATE OFFICE BLDG.
TOPEKA, KANSAS 66612
ROBERT C. HARDER, Secy.

KANSAS NEUROLOGICAL INSTITUTE
3107 WEST 21st St.
TOPEKA, KANSAS 66604
LEONARD W. LAVIS, Supt.

Dear

As you might know, individuals at the Kansas Neurological Institute (Doug Guess and Wayne Sailor), Kansas State University (Thomas M. Longhurst), and the University of Kansas - Medical Center (George Cairns and Earl Butterfield) were awarded a Federal grant (Contract No. OEC-0-74-9184) to conduct a thorough search of speech and language acquisition, assessment, and intervention literature.

One of the project's goals involved the development of a dissemination procedure by which researchers, teachers, clinicians, etc., could take advantage of the work done at the three sites. This process has taken form in a computer-based, library-storage-and-retrieval system. Each article that has been selected for inclusion has been reviewed, coded, and stored on magnetic tapes. Some of the articles have also been abstracted. By programming certain key-words the system is capable of retrieving an alphabetical listing of all articles sharing those key-words. Over 100 key-words (or descriptors) were used. Thus far, most of the requests and retrieves have been made through "in-house" requests. Thus, we could be almost certain that the coding forms were completed exactly as the user intended, and the resulting print-out represented what the user had expected. The system needs to be tested on a much larger scale, however.

Because of your interest in speech and language development, we would like to know if you would be willing to help us test the dissemination process more severely. Enclosed is a copy of our "Users Request Manual." We would like you to read the manual and make a request in accordance with the instructions provided. We will then conduct a search of the system's data base and send you a computer print-out of the results. All processing and handling costs will be assumed through grant funds. At a later date we will ask you if the print-out you received was what you expected. We would also like you to offer constructive feedback.

One of the things we hope to determine as a result of your participation is the average cost per search and retrieve. We already know that a complete "dump" of our data base is quite expensive, and because of this great expense, we cannot allow you to make such a request at the present time. In addition, such a comprehensive request does not test the system since the computer program does not have to search the data base.

Enclosure (c)

We sincerely hope that you will agree to help us field test the system.

Very truly yours,

William J. Keogh
Project Director

WJK:lrb

cc: Guess
Sailor
Longhurst
Cairns
Butterfield

USERS REQUEST MANUAL
(FIELD-TEST VERSION)

LANGUAGE LIBRARY RETRIEVAL SYSTEM

RFP 74-59

issued by DHEW/Office of Education
Contracts and Grants Division, School
Systems Branch, Contract/Order No.
OEC-0-74-9184

DEVELOPERS:

Doug Guess, Wayne Sailor, and William Keogh
Kansas Neurological Institute

Thomas Longhurst
Kansas State University

George Cairns and Earl Butterfield
University of Kansas-Medical Center

Clayton Sutton
Systems Analyst

USER'S NAME_____ DATE_____

MAILING ADDRESS_____

_____

_____

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SECTION I

The Language-Library-Retrieval System (LLRS) is a resource available to teachers, clinicians, paraprofessionals, researchers, and others interested in speech and language development. The system evolved as part of a federally funded BEH project (Contract No. OEC-0-74-9184) awarded jointly to the Kansas Neurological Institute, Kansas State University, and the University of Kansas-Medical Center. Some of the project goals were to: 1) compile, assimilate, and integrate pre-language and linguistic assessment procedures; 2) review the literature relevant to normally developing linguistic and prelinguistic processes; 3) identify existing intervention strategies appropriate to speech and language handicaps; and 4) disseminate the accumulated assessment, acquisition, and intervention literature in such a way that it becomes useful to any potential user. The dissemination process has taken form through the LLRS.

There are several information storage and retrieval systems in use today. Typically, "key-words" or descriptors are used to code materials for easy retrieval at a later date. The location of the "storage place," of course, varies depending on the nature of the particular system used. For example, one of the most widely used information storage and retrieval systems is the public library. In this system, the librarian reviews thousands of books and other materials, decides if they should be stored on the shelves, and prepares file cards to code each one so that it can be easily retrieved. Other systems use computers to store information. The system developed at the Kansas Neurological Institute (the LLRS) is a computer-based storage and retrieval system. Examples of other systems using computers to store and search for information are the Psychological Abstracts and the ERIC (Educational Resources Information Center) systems. The fundamental difference between the LLRS and other computer-based storage and retrieval systems is that the LLRS is the only one that is concerned exclusively with speech and language acquisition, assessment, and intervention.

HOW TO USE THE LLRS

The system's entire data base has been divided into two speech and language dimensions. One dimension stores only training and intervention materials; the other dimension stores only assessment and/or acquisition materials. Because of this division, you will not be allowed to intermix the two dimensions.[1] Thus, the first thing you must decide is if the area of interest falls into the training (or nontraining) dimension. Sometimes an area of interest will include both dimensions. When this happens, two separate request manuals must be completed: one to retrieve the information stored in the training dimension; one to retrieve the information stored in the acquisition/assessment dimension.

After you have decided upon the training or the assessment/acquisition dimension, Section II on Page 6 should be completed. The type of search that the computer will perform becomes more and more restrictive as more and more key-words are selected. For example, if a user wants to retrieve every article that has been coded ACQUISITION, only the descriptor ACQUISITION should be blackened; a very large print-out will result. When the descriptor MENTALLY RETARDED is added, the resulting print-out will be considerably smaller. Suppose further, that the descriptors AGE 4, EXPRESSIVE FIRST WORD, and INTELLIGENCE are also included. The search will locate and retrieve only a few (if any) articles that share these descriptors. IT IS IMPORTANT TO REMEMBER THAT THE GREATER THE NUMBER OF DESCRIPTORS USED, THE MORE RESTRICTIVE THE RETRIEVE BECOMES.

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[1] There is one exception to this rule. It is possible to obtain an alphabetical listing of every article stored in the system by following the instructions on page 5 of this manual. However, such a comprehensive listing defeats the purpose of the system because the "search feature" is not used.

Section III (color coded Green) should be used only if training articles are to be retrieved. Section IV (color coded Pink) should be used only if acquisition and/or assessment articles are to be retrieved. Detailed instructions are provided in each section and you will be required to code your request twice. First, the coding places shown in each of the descriptor boxes throughout this manual must be completed as needed; second, the Answer Sheet (page 21) must be coded to correspond with the selections made in the respective descriptor boxes. Both codings must be returned to us with the entire manual. If the key words shown in a particular box are not important to you, it is probably better to skip the box entirely. REMEMBER, THE GREATER THE NUMBER OF DESCRIPTORS USED, THE MORE RESTRICTIVE THE RETRIEVE BECOMES.

Look over all of the descriptors shown in the training or nontraining sections before coding your selections. You will see that there are two kinds of key-word descriptors: 1) speech and language related descriptors such as IMITATION, VERBS, NOUN, etc.; 2) nonspeech and language related descriptors such as MENTALLY RETARDED, PARENTS, HEARING IMPAIRED, etc. Either or both kinds of descriptors can be used when making a request. For example, if TRAINING is selected as the major dimension to be searched and only the descriptor CHILD CARE WORKER is added, all training articles involving TRAINING and CHILD CARE would be retrieved. This same feature applies when using the ACQUISITION and/or ASSESSMENT dimension.

Many of the speech and language related descriptors have a receptive (or comprehension) form and an expressive (or production) form. It is important to consider (and select if desired) the expressive and/or receptive form of speech or language skill. For example, if a child points to a "round bouncy thing" and says "Ball," the child is demonstrating expressive language behavior; if the parent says to the child "Take the ball out of your toy box" after which the child complies with the instruction, language reception has been demonstrated. The definitions of expressive and receptive language are given in Section V.

A lead pencil should be used for coding. After both coding places (the descriptor boxes and the Answer Sheet) have been completed, this entire manual should be returned to the Kansas Neurological Institute (the address is given below). Your search will be expedited as soon as it is received at the KNI site and an alphabetical computer print-out will be mailed to you within two weeks.

LANGUAGE LIBRARY RETRIEVAL SYSTEM
KANSAS NEUROLOGICAL INSTITUTE
3107 West 21st Street
Topeka, Kansas 66604

SECTION II

Every article that has been stored in this system has been coded a Training article or as an Assessment and/or Acquisition article. With one exception, requests for training and assessment/acquisition articles cannot be made on the same request form. Two separate requests (and manuals) must be used. One request manual is used to search for all of the training articles; the other manual is used to search for all of the assessment/acquisition articles. The one exception to this occurs when a request is made for every article that can be retrieved. Such a general request can be made on a single form and you will receive an alphabetical listing of every article that has been stored in the system. To make such a request, blacken space 1-A below and space 1-A on the Answer Sheet. The Answer Sheet appears on page 21 of this Request Manual.

Box 1

BLACKEN ONLY ONE SPACE:

	A
1.	:::::: RETRIEVES ENTIRE SYSTEM

If Box 1 was selected, STOP HERE and return the Request Form to: LANGUAGE LIBRARY RETRIEVAL SYSTEM, THE KANSAS NEUROLOGICAL INSTITUTE, 3107 West 21st STREET, TOPEKA, KANSAS 66604. Make sure that you have included your name and address on the Face Sheet and on the Answer Sheet.

For a more specific retrieve, turn to next page

Please read the instructions contained in each of the boxes below before blackening a space. Only one of the boxes may be selected. If more than one descriptor-box is required, a separate manual for each box must be filled out. Two or more blackened spaces on this page cannot be read by the computer and your request will not be processed.

Box 2

TRAINING ARTICLES: To receive an alphabetical listing of only training articles, blacken space 2-A below and space 2-A of the Answer Sheet. The Answer Sheet is the last page of this manual. If all training articles are desired no other boxes need to be filled out. If more specific training information is desired, turn to Section III after completing this box.

	A	B	C	D	E
2.	------	------	------	------	------

Box 3

ASSESSMENT ARTICLES: To receive an alphabetical listing of only assessment articles, blacken space 3-A below and space 3-A of the Answer Sheet. The Answer Sheet is the last page of this manual. If all assessment articles are desired, no other boxes need to be filled out. If more specific assessment information is desired, turn to SECTION IV after completing this box.

	A	B	C	D	E
3.	------	------	------	------	------

Box 4

ACQUISITION ARTICLES: To receive an alphabetical listing of only acquisition articles, blacken space 4-A below and space 4-A of the Answer Sheet. The Answer Sheet is the last page of this manual. If all acquisition articles are desired, no other boxes need to be filled out. If more specific acquisition information is desired, turn to SECTION IV after completing this box.

	A	B	C	D	E
4.	------	------	------	------	------

Box 5

ASSESSMENT and/or ACQUISITION ARTICLES: To receive an alphabetical listing of articles other than training articles, blacken space 5-A below and space 5-A of the Answer Sheet. The Answer Sheet is the last page of this manual. If all nontraining articles are desired, no other boxes need to be filled out. If more specific assessment/acquisition information is desired, turn to SECTION IV after completing this box.

	A	B	C	D	E
5.	------	------	------	------	------

SECTION III

TRAINING ARTICLES

This section should be used only if speech and language training articles are to be retrieved. If acquisition and/or assessment articles are of interest see Section IV.

SECTION III

This section should be completed only if BOX 2 on page 6 was selected. Read the instructions contained in each Descriptor-Box below before blackening a space. None, one, or more than one descriptor can be selected on this page. IT IS IMPORTANT TO REMEMBER, HOWEVER, THAT THE GREATER THE NUMBER OF SPACES BLACKENED THE MORE RESTRICTIVE THE RETRIEVE BECOMES. There is always the danger of being too general or too specific when making a request.

Box 6

REVIEW ARTICLES: If REVIEW ARTICLES is the only selection made in SECTION III, you will receive an alphabetical listing of every training article that was judged to be a review. If additional key-word descriptors are coded in this section, you will receive a listing of reviews specific to the descriptors selected. To limit your retrieve to review articles, blacken in the space below and in the corresponding space on the Answer Sheet.

	A	
6.	------	REVIEW ARTICLES

Box 7

SUBJECT POPULATION: Articles can be retrieved on the basis of the population that received language training. One or more of the descriptors listed below may be selected. If the specific population is not critical to the type of retrieve desired, this box may be skipped entirely. If you do want to restrict the retrieve further, blacken the space or spaces of interest below and on the Answer Sheet that is included as the last page of this manual.

	A			A	
7.	------	NORMAL	11.	------	BLIND
	A			A	
8.	------	EMOTIONALLY DISTURBED	12.	------	DEAF
	A			A	
9.	------	MENTALLY RETARDED	13.	------	HEARING IMPAIRED
	A				
10.	------	ORTHOPEDICALLY HANDICAPPED			

Box 8

AGE: This box allows a retrieve according to the age of the person who was trained. If age is not critical to the type of retrieve desired, this box may be skipped entirely. If you do want to restrict further, blacken the desired space or spaces below and on the Answer Sheet. The Answer Sheet is included as the last page of this manual.

	A			A	
14.	------	(0 or Infant)	18.	------	(Age Four)
	A			A	
15.	------	(Age One)	19.	------	(Age Five)
	A			A	
16.	------	(Age Two)	20.	------	(Age Six)
	A			A	
17.	------	(Age Three)	21.	------	(Age Seven and over)

Box 9

TRAINER: In some articles, speech and language training was administered by highly skilled technicians. In other articles, parents, child care personnel, and even peers were the trainers. If the descriptors found in this box are not critical to the type of retrieve desired, this box may be skipped entirely. If you do want to restrict your retrieve further, blacken one or more of the choices given below and on the Answer Sheet. The Answer Sheet appears as the last page of this manual.

	A			A	
22.	------	(Experimenter)	25.	------	(Parents)
	A			A	
23.	------	(Peers)	26.	------	(Child Care Worker)
	A				
24.	------	(School Teacher)			

Box 10

SETTING: Language training may occur between the teacher and the student only, between the teacher and a small group of students (from 2 to 4), or in large classroom settings. If the descriptors found in this box are not critical to the type of retrieve desired, the box may be skipped entirely. If you are interested in articles that stressed one or more of these settings, blacken the appropriate space(s) below and on the Answer Sheet. The Answer Sheet appears as the last page of this manual.

	A			A	
27.	------	(One-to-One)	28.	------	(2-4 Students)
			A		
			29.	------	(More than 4)

Box 11

LANGUAGE SKILL TRAINED: One or more of the language skills listed below may be selected in this box. Make your selections by blackening the appropriate spaces below and on the Answer Sheet. The Answer Sheet appears as the last page of this manual. THIS IS THE LAST TRAINING BOX TO BE COMPLETED. After you have completed this box, return the entire manual to: LANGUAGE LIBRARY RETRIEVAL SYSTEM, THE KANSAS NEUROLOGICAL INSTITUTE, 3107 West 21st Street, Topeka, Kansas 66604.

A		A	
30. ------	Expressive Audiometry	31. ------	Receptive Audiometry
A		A	
32. ------	Expressive Tone Discrimination	33. ------	Receptive Tone Discrimination
A		A	
34. ------	Expressive Speech Discrimination	35. ------	Receptive Speech Discrimination
A		A	
36. ------	Expressive Motor Response	37. ------	Receptive Motor Response
A		A	
38. ------	Expressive Motor Imitation	39. ------	Receptive Motor Imitation
A		A	
40. ------	Expressive Vocal Imitation	41. ------	Receptive Vocal Imitation
A		A	
42. ------	Expressive Verbal Imitation	43. ------	Receptive Verbal Imitation
A		A	
44. ------	Expressive Nouns	45. ------	Receptive Nouns
A		A	
46. ------	Expressive Pronouns	47. ------	Receptive Pronouns
A		A	
48. ------	Expressive Verbs	49. ------	Receptive Verbs
A		A	
50. ------	Expressive Adverbs	51. ------	Receptive Adverbs
A		A	
52. ------	Expressive Adjectives	53. ------	Receptive Adjectives

CONTINUED ON NEXT PAGE

Box 11 (continued)

A 54. ------ Expressive Articles	A 55. ------ Receptive Articles
A 56. ------ Expressive Prepositions	A 57. ------ Receptive Prepositions
A 58. ------ Expressive Conjunctions	A 59. ------ Receptive Conjunctions
A 60. ------ Expressive Suffix	A 61. ------ Receptive Suffix
A 62. ------ Expressive Inflection	A 63. ------ Receptive Inflection
A 64. ------ Expressive Negation	A 65. ------ Receptive Negation
A 66. ------ Expressive Questions	A 67. ------ Receptive Questions
A 68. ------ Expressive Articulation	A 69. ------ Receptive Articulation
A 70. ------ Expressive Vocal/Verbal Rate	A 71. ------ Do not use this space
A 72. ------ Expressive Non-Speech Communication Modes	A 73. ------ Receptive Non-Speech Communication Modes
A 74. ------ Expressive Spontaneous Speech	A 75. ------ Do not use this space

SECTION IV

ASSESSMENT and/or ACQUISITION ARTICLES

This section should be used only if speech and language assessment and/or acquisition articles are to be retrieved. If training articles are of interest see SECTION III.

SECTION IV

This section should be completed only if Box 3, 4, or 5 on page 6 was selected. Read over all of the instructions given in this section before blackening a space. None, one, or more than one descriptor can be selected on this page. IT IS IMPORTANT TO REMEMBER, HOWEVER, THAT THE GREATER THE NUMBER OF SPACES BLACKENED THE MORE RESTRICTIVE THE RETRIEVE BECOMES. There is always the danger of being too general or too specific when making a request.

Box 12

REVIEW ARTICLES: If REVIEW ARTICLES is the only selection made in SECTION IV, you will receive an alphabetical listing of every assessment and/or acquisition article that was judged to be a review. If additional key-word descriptors are coded in this section, you will receive a listing of reviews specific to the descriptors selected. To limit your retrieve to review articles, blacken the space below and the corresponding space on the Answer Sheet. The Answer Sheet appears as the last page of this manual.

A
6. ------ REVIEW ARTICLES

Box 13

SUBJECT POPULATION: Articles can be retrieved on the basis of the population. One or more of the descriptors listed below may be selected. If the specific population is not critical to the type of retrieve needed, this box may be skipped entirely. To include a specific population as part of the retrieve, blacken one or more of the spaces below and on the Answer Sheet. The Answer Sheet appears as the last page of the manual.

A
7. ------ NORMAL

A
8. ------ EMOTIONALLY
------ DISTURBED

A
9. ------ MENTALLY RETARDED

A
10. ------ ORTHOPEDICALLY
------ HANDICAPPED

A
11. ------ BLIND

A
12. ------ DEAF

A
13. ------ HEARING
------ IMPAIRED

Box 14

AGE: This box allows a retrieve according to age. If age is not critical to the type of retrieve needed, this box may be skipped entirely. To include age as part of the retrieve, blacken one or more of the spaces below and blacken the corresponding space(s) on the Answer Sheet. The Answer Sheet appears as the last page of this manual.

14.	A ------ (0 or infant)	18.	A ------ (age four)
15.	A ------ (age one)	19.	A ------ (age five)
16.	A ------ (age two)	20.	A ------ (age six)
17.	A ------ (age three)	21.	A ------ (age seven and over)

This part of SECTION IV contains five broad speech and language categories relating to assessment and acquisition. The first descriptor (shown in capital letters) in each box below identifies the major speech and language category. The remaining descriptors are sub-categories of the main one. All of the information contained in any box can be retrieved by blackening the space next to the descriptor shown in capital letters. For a more selective retrieve, blacken one or more of the sub-category descriptors but not the descriptor shown in capital letters. For example, by blackening spaces 76 A ------ and 77 A ------ next to the descriptor PHONOLOGY, every article dealing with segmentals, suprasegmentals, and distinctive features will be retrieved. However, if only articles relating to distinctive features are desired, then 82 A ------ and 83 A ------ should be blackened <u>but not</u> <u>PHONOLOGY</u>. Any combinations of descriptors can be coded in this section by blackening the space(s) next to the key word(s) below and the corresponding space(s) on the Answer Sheet. The Answer Sheet appears as the last page of this manual.

Turn to next page

PHONOLOGY:

Box 15

76.	A ------ EXPRESSIVE PHONOLOGY	77.	A ------ RECEPTIVE PHONOLOGY
78.	A ------ Expressive Segmentals	79.	A ------ Receptive Segmentals
80.	A ------ Expressive Suprasegmentals	81.	A ------ Receptive Suprasegmentals
82.	A ------ Expressive Distinctive Features	83.	A ------ Receptive Distinctive Features

MORPHOLOGY:

Box 16

84.	A ------ EXPRESSIVE MORPHOLOGY	85.	A ------ RECEPTIVE MORPHOLOGY
86.	A ------ Expressive Pluralization	87.	A ------ Receptive Pluralization
88.	A ------ Expressive Possessives	89.	A ------ Receptive Possessives
90.	A ------ Expressive Tense	91.	A ------ Receptive Tense
92.	A ------ Expressive Comparative-Superlative	93.	A ------ Receptive Comparative-Superlative
94.	A ------ Expressive Adverb Forms	95.	A ------ Receptive Adverb Forms

SYNTAX:

Box 17

96.	A ------ EXPRESSIVE SYNTAX	97.	A ------ RECEPTIVE SYNTAX
98.	A ------ Expressive Holophrastic	99.	A ------ Receptive Holophrastic
100.	A ------ Expressive Pivot Grammar	101.	A ------ Receptive Pivot Grammar
102.	A ------ Expressive Negation	103.	A ------ Receptive Negation
104.	A ------ Expressive Interrogation	105.	A ------ Receptive Interrogation
106.	A ------ Expressive Pronominalization	107.	A ------ Receptive Pronominalization
108.	A ------ Expressive Reflexivation	109.	A ------ Receptive Reflexivation
110.	A ------ Expressive Passive	111.	A ------ Receptive Passive
112.	A ------ Expressive Imperative	113.	A ------ Receptive Imperative
114.	A ------ Expressive Conjunction	115.	A ------ Receptive Conjunction
116.	A ------ Expressive Contraction	117.	A ------ Receptive Contraction

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Continued from Previous Page

SEMANTICS AND BASIC CONCEPTS:

Box 18

118. A	EXPRESSIVE SEMANTICS AND BASIC CONCEPTS	119. A	RECEPTIVE SEMANTICS AND BASIC CONCEPTS
120. A	Expressive "First Word"	121. A	Receptive "First Word"
122. A	Expressive Vocabulary Development	123. A	Receptive Vocabulary Development
124. A	Expressive Word Association	125. A	Receptive Word Association
126. A	Expressive Word Meaning	127. A	Receptive Word Meaning
128. A	Expressive Sentence Meaning	129. A	Receptive Sentence Meaning
130. A	Expressive Nouns	131. A	Receptive Nouns
132. A	Expressive Pronouns	133. A	Receptive Pronouns
134. A	Expressive Verbs	135. A	Receptive Verbs
136. A	Expressive Adverbs	137. A	Receptive Adverbs
138. A	Expressive Adjectives	139. A	Receptive Adjectives
140. A	Expressive Articles	141. A	Receptive Articles
142. A	Expressive Conjunctions	143. A	Receptive Conjunctions
144. A	Expressive Prepositions	145. A	Receptive Prepositions

MISCELLANEOUS: Use only if Box 3, 4, or 5 on page 6 was checked

Box 19

146. A	MISCELLANEOUS (retrieves everything listed below)		
148. A	Private Speech	149. A	Adult-Child Interaction
150. A	Sex	151. A	Siblings
152. A	Role-Taking	153. A	Memory
154. A	Universals	155. A	Innateness
156. A	Attention	157. A	Mediation
158. A	Imitation	159. A	Intelligence

After completing the ASSESSMENT and/or ACQUISITION section, re-check your selections to make sure that they have been blackened properly. It is important that you have blackened your selections on the Answer Sheet (the last page of the manual) and in the spaces provided in each of the boxes in this section. Return the form to: LANGUAGE LIBRARY RETRIEVAL SYSTEM, KANSAS NEUROLOGICAL INSTITUTE, 3107 West 21st STREET, TOPEKA, KANSAS 66604.

NOTE: Make sure that you have listed your name and address on the face sheet of this manual and on the Answer Sheet.

SECTION V

GLOSSARY OF TERMS AND SYNONYMS

Most of the key-words, or descriptors, used in this manual are alphabetically defined in this section. In addition, a list of synonyms has been included.

ACQUISITION - refers to the manner in which speech and language develops in the absence of programmed intervention or training.

ADVERB - used in the traditional manner (i.e., a word that modifies a verb, adjective or another adverb). Examples: What, When, Where.
NOTE: YES and NO have been classified under the descriptor NEGATION. Also see QUESTIONS.

ADVERB FORMS - used traditionally, often involves adding -ly to words - (John runs slowly).

ADJECTIVE - used in the traditional manner (i.e., a word that modifies a noun or pronoun, etc.). Examples: Red, Big, Fat. Also see QUESTION.

ARTICLE - used in the traditional manner. Examples: A, An, and The.

ARTICULATION - the ability to produce a clear and properly stressed word, phrase, or sentence. (Examples: Spoon instead of "poon"; Chair instead of "tair.")

ASSESSMENT - refers to formal (i.e., Standardized Tests) and informal (i.e., nonstandardized test and observational data) methods used to measure speech and language competency.

ATTENTION - used traditionally - role of attention in language development.

AUDIOMETRY - the use of audiometric instruments to measure the hearing acuity of an individual, usually done by a trained audiologist.

CHILD-ADULT INTERACTION - verbal interaction between child and adult; mothers' speech directed to children, adults' speech to retardates, etc.

COLORS - See ADJECTIVES.

COMPARATIVE SUPERLATIVE - the use of er and est suffixes as labels, to identify correctly quantitative relationships between stimuli.

COMPREHENSION - See RECEPTIVE.

CONJUNCTION (No. 1) - a word used in the traditional manner (i.e., to join two or more words, phrases, or sentences). Example: And. See CONJUNCTION (No.2).

CONJUNCTION (No. 2) - a process of joining parts of sentences together. Frequently used conjunctions include and, but, or either, when and because. See CONJUNCTION (No. 1).

CONTRACTION - a word made up of two words combined into one by omitting one or more sounds. In graphics, an apostrophe is used to show where letters have been omitted in a contraction.

CONVERSATIONAL SPEECH - See SPONTANEOUS SPEECH.

DISTINCTIVE FEATURES - the characteristics of a sound that make it different from other sounds; looking at sounds according to their articulatory features.

EXPRESSIVE - in this system - refers to the ability to produce spoken words (or to discriminate between and manipulate plastic chips, discs, or other symbols) for the purpose of functional communication with another or others. See bottom of page 3.

FIRST WORD - the final product of the babbling stage, the first true word appears at approximately 12 months; sounds uttered with meaning.

HOLAPHRASTIC - the use of a single utterance which has a diffuse number of meanings. Children use a single word as sentences..

IMITATION - learning by doing as others do; role in language development; use in assessment; also see specific kind of imitation (i.e., motor, vocal, verbal).

IMPERATIVE - an utterance that gives a command or makes a request.

INFLECTION - grammatical forms used to change case, gender, tense, voice, etc. Examples: s, es, ed, ance. NOTE: INFLECTION AND SUFFIX are used interchangeably in this system. Blacken the spaces provided next to the descriptors INFLECTION AND SUFFIX to ensure that the search will be complete.

INNATENESS - pertaining to biological predispositions for language.

INTELLIGENCE - used traditionally, tests, global or specific learning skills, effects on language development.

INTERROGATIVE - a sentence that asks a question. See QUESTION.

LABELLING - the ability to identify persons, places, objects, actions, or relationships. Examples: Baby, John, In, On. See the appropriate language descriptor such as NOUNS, PREPOSITIONS, VERBS, etc., when coding.

MEDIATION - having to do with cognitive development, internal processing variable.

MEMORY - including short term and long term ability to remember and its relationship to language development and assessment.

MISCELLANEOUS - topics related to language development.

MORPHOLOGY - that portion of the language that constitutes the rules for word formation and word inflection.

MOTOR IMITATION - an observable movement which closely follows an observable movement of another (the model) and which is topographically similar to that of the model's. Example: A teacher touches a table and says, "DO THIS" to a child. The child's table touching response is a motor imitation.

MOTOR RESPONSE - that which relates to fine or gross muscular movement. Examples: leg kick, walking, pointing, etc.

NAMING - See LABELLING.

NEGATION - used traditionally for utterances that contain no, not, don't, doesn't, etc. (i.e., to convey nonexistence, rejection, or denial).

NON SPEECH COMMUNICATION MODES - refers to the functional use of language involving non speech symbols such as plastic discs, chips, tiles, etc. NOTE: Articles involving sign language such as the American Sign Language System or related systems were not extensively reviewed within the Training Dimension of the LLRS.

NORMAL DEVELOPMENT - see ACQUISITION.

NOUN - used in the traditional manner (i.e., the name of a person, place, or object). Examples: John, Chicago, car.

PASSIVE - a verb is in the passive voice when it expresses an action performed upon its subject or when the subject is the result of the action.

PHONOLOGY - pertaining to the sound system of a language or the study of the acoustic characteristics of speech.

PIVOT GRAMMAR - the pivot class reveals itself when the chid begins to speak in two word utterances. The child uses one class of words, the pivot, a small class of words used frequently, and combines it with the open class, a large number of words used less frequently, to form a two word sentence.

PLURALIZATION - the use of plural markers to designate more than one.

POSSESSIVE - pertaining to ownership or possession.

PREPOSITION - used in the traditional manner (i.e., a word used to show the relation of a noun or pronoun to some other word in a sentence). Examples: on, inside, under.

PRIVATE SPEECH - sometimes referred to as egocentric or nonsocialized speech. Speech uttered by young children without apparent attempt to communicate.

PRONOMINALIZATION - traditionally, the process of using certain words to take the place of nouns; pronoun system is represented as a paradigm with three features - person, number and case - which serve to differentiate among its members.

PRONOUN - used in the traditional manner (i.e., a word used as a substitute for one or more nouns). Example: He, she, it. Also see QUESTION.

PRODUCTION - see EXPRESSIVE.

QUESTION - used in the traditional manner (i.e., a word, phrase, or sentence expressing the interrogative). Examples: Who, What, Where, Why, etc. NOTE: Use this descriptor to get articles that trained Wh- questions, not the adverb, adjective, or pronoun descriptor.

RATE - a unit of measure used to assess the frequency of behavior over time (usually one minute). Examples: an infant's vocal rate; the rate of a child's spontaneous speech. See VOCAL/VERBAL RATE.

RECEPTIVE - in this system - refers to the ability to interpret spoken words, phrases, or sentences (or the arrangement of plastic chips, discs, or other symbols) of another in such a way as to demonstrate understanding of the utterance or symbol arrangement. See bottom of page 3.

REFLEXIVATION - personal pronoun combined with -self or -selves.

ROLE-TAKING - cognitive-communication research and theory dealing with putting oneself in the role of others.

SEGMENTALS - primarily vowels and consonants.

SEMANTICS AND BASIC CONCEPTS - involves the meaning of words, categories, relationships, and contrasts. The meaning system.

SENTENCE MEANING - pertaining to how word combinations acquire meaning relationships.

SEX - sex differences in research.

SIBLINGS - studies dealing with affects of siblings or lack thereof in language development.

SIGN LANGUAGE - See NON SPEECH COMMUNICATION MODES.

SIZE - See ADJECTIVES.

SPEECH DISCRIMINATION - the ability to detect differences between two or more words, sentences, intonation or pitch patterns, speakers, etc. In this system, speech discrimination is used most often with audiometry, See AUDIOMETRY.

SPONTANEOUS SPEECH - the use of words, gestures, plastic discs, or other symbols to functionally communicate with others. In this system spontaneous speech is most often associated with environments that do not have programmed discriminative stimuli such as is found in language training classes.

SUFFIX - See INFLECTIONS.

SUPRASEGMENTALS - above the level of segmentals or that portion of phonology that involves the stress, pitch and juncture features of an utterance.

SYNTAX - the principle that governs the way in which words can be arranged together to form meaningful groups; rules for word combination and order.

TENSE - transformation rules that change time aspects of utterances.

TRAINING - refers to a programmed relationship between antecedent stimuli, responses, and consequent events for the purposes of establishing appropriate speech and language, or for eliminating inappropriate speech or language.

TONE DISCRIMINATION - refers to the ability to differentiate between two or more auditory stimuli. In this system Tone Discrimination is used most often in association with Audiometry. See AUDIOMETRY.

UNIVERSALS - similar aspects of grammar that appear in all because people are born with capacity for language.

VERBAL - words, phrases, or sentences of the English language. Examples: Baby but not /ba/; Daddy but not /da/. See VERBAL IMITATION; VOCAL; VOCAL IMITATION.

VERBAL IMITATION - a word, phrase, or sentence which closely follows a word, phrase, or sentence (respectively) of another (the model) and which is topographically similar to that of the model's. Example: A teacher instructs a child to say "WANT"; the child's "want" response is a verbal imitation of the model's utterance. NOTE: The terms vocal and verbal are not used synonymously in this system. See VERBAL; VOCAL.

VERB - used in the traditional manner (i.e., a word that expresses an action or occurrence). Examples: Run; Walking; Want.

VOCABULARY DEVELOPMENT - acquisition of referents (words) with meaning - involves studies of quantity and quality.

VOCAL - in this system vocal refers to an utterance in the phonological system which has a vowel as its nucleus. Examples: /ba/ but not Baby; /da/ but not Daddy. See VERBAL; VOCAL IMITATION; VERBAL.

VOCAL IMITATION - a speech-like utterance which closely follows a speech-like utterance of another (the model) and which is topographically similar to that of the model's. Example: A teacher instructs a child to say "ba." The child's "ba" response is a vocal imitation of the model's utterance. NOTE: The terms vocal and verbal are not used synonymously in this system. See VERBAL; VOCAL.

VOCAL/VERBAL RATE - the measure of the frequency of speech sounds or words over a standard unit of time (usually one minute). Examples: The assessment of an infant's vocal rate; the rate of a child's spontaneous speech. See VOCAL; VERBAL.

WORD ASSOCIATION - used traditionally, tasks in research, word hierarchy, etc.

WORD MEANING - pertaining to theory and research on how words acquire meaning.